Clemco Industries Corp.

presents

Design Considerations for Abrasive Blast Rooms & Recovery Systems

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Report Documentation Page

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PLANNING CONSIDERATIONS

- ENCLOSURE
- LOCATION OF ROOM
  - COMPLETELY INSIDE
  - ROOM INSIDE, COLLECTOR OUTSIDE
  - COMPLETELY OUTSIDE
  - PARTIALLY OUTSIDE
- RECOVERY SYSTEM LOCATION
  - ON TOP OF EXISTING FLOOR
  - FLUSH-MOUNTED (RECOVERY SYSTEM IN PIT)

TYPES OF ENCLOSURES

- FLANGE BOLT
  - ECONOMICAL
  - MAXIMUM WIDTH LIMITED TO 16 FEET
- HYBRID FLANGE BOLT
  - FLANGE BOLT WITH STIFFENERS
- COLUMN BOLT
  - ALLOWS FOR WIDER ENCLOSURES
  - STRONG ENOUGH TO SUPPORT MONORAIL

Flange Bolt Room

Column Bolt Room

- Structural steel framework
- Galvanized steel panels

COMMON FEATURES

- GALVANIZED CONSTRUCTION
- FLOOR-TO-CEILING DOORS CAN BE INSTALLED INTO ONE OR BOTH ENDS
- PERSONNEL DOORS CAN BE INSTALLED IN ANY WALL PANEL
  - REQUIRED EVERY 30 FEET PER O.S.H.A.
- OPTIONS
  - EXTERIOR WORK STATIONS
  - SPECIAL LIGHTING

Inlet Door Installation

AIR INLETS

- Baffled inside & outside
- Filtered

MANDOOR

- Panic Hardware
- Viewer with cover

ILLUMINATION

- TYPICALLY, 50-80 FOOT CANDLES IS SUFFICIENT
- FLUSH-MOUNTED TO CEILING
  - PROTECTED FROM INADVERTENT BLASTING
  - SEALED TO AVOID DUST INGRESS
- ADDITIONAL WALL-MOUNTED LIGHTS PROVIDE SHADOW FREE ILLUMINATION

Light Module

EXTERIOR WORK STATION

RECOVERY FLOOR TYPES

- SWEEP-IN
  - 2x2 AND 3x3 HOPPERS
    - MECHANICAL RECOVERY
    - FOR DENSE MEDIA, SUCH AS STEEL GRIT AND SHOT
  - M-SECTION STRIP
    - PNEUMATIC RECOVERY
    - FOR LIGHTWEIGHT MEDIA, SUCH AS GLASS BEADS, ALUMINUM OXIDE, AND PLASTIC
- PARTIAL FLOOR
  - MULTIPLE M-SECTIONS
  - SCREW
  - -BELT

RECOVERY FLOOR TYPES
continued

- FULL FLOOR
  - MECHANICAL RECOVERY
    - FLAT-TRAK
    - SCREW CONVEYORS
    - BELT CONVEYORS
  - PNEUMATIC RECOVERY
    - M-SECTION

FULL FLOOR RECOVERY

- COMPLETELY AUTOMATES THE MEDIA RECOVERY PROCESS
- MECHANICAL RECOVERY
  - SCREW CONVEYOR
  - -BELT CONVEYOR
  - FLAT-TRAK
- PNEUMATIC RECOVERY
  - M-SECTION

PARTIAL FLOOR RECOVERY

- REDUCES MANHOURS SPENT ON RECOVERY, COMPARED TO SWEEP-IN
- SCREW OR BELT CONVEYOR(S) TO BE USED WITH DENSE MEDIA SUCH AS STEEL
- M-SECTION STRIPS TO BE USED WITH LIGHTWEIGHT MEDIA SUCH AS ALOX AND GLASS BEADS

HOPPER RECOVERY SYSTEMS

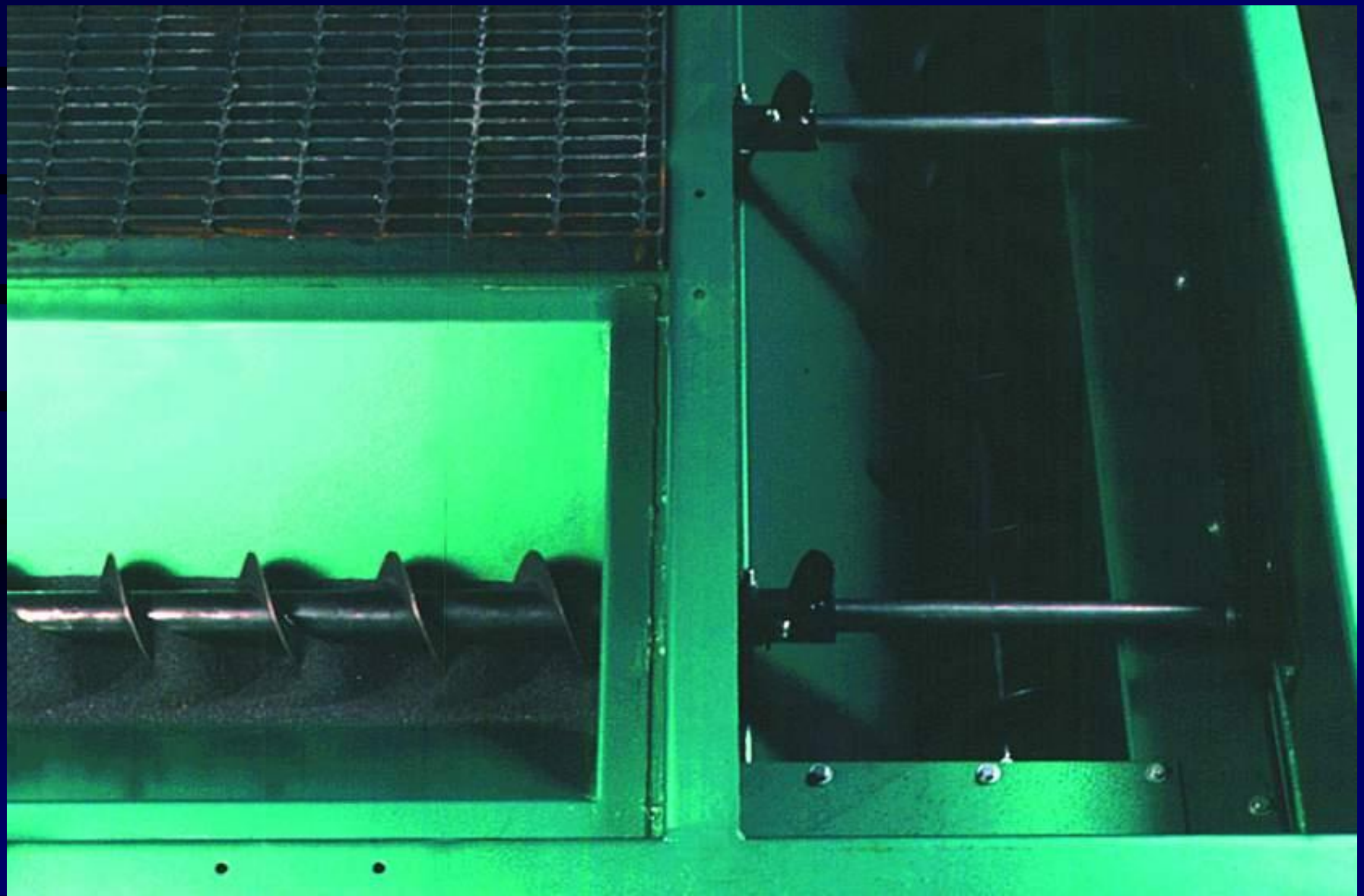
- SURFACE MOUNTED OR RECESSED
- LOW INITIAL COST
- REQUIRES MANUAL LABOR
  - SWEEPING OR SHOVELING
- 120 MESH MEDIA OR COARSER

3 x 3 HOPPER RECOVERY SYSTEM

3 x 3 HOPPER SWEEP-IN

BELT RECOVERY

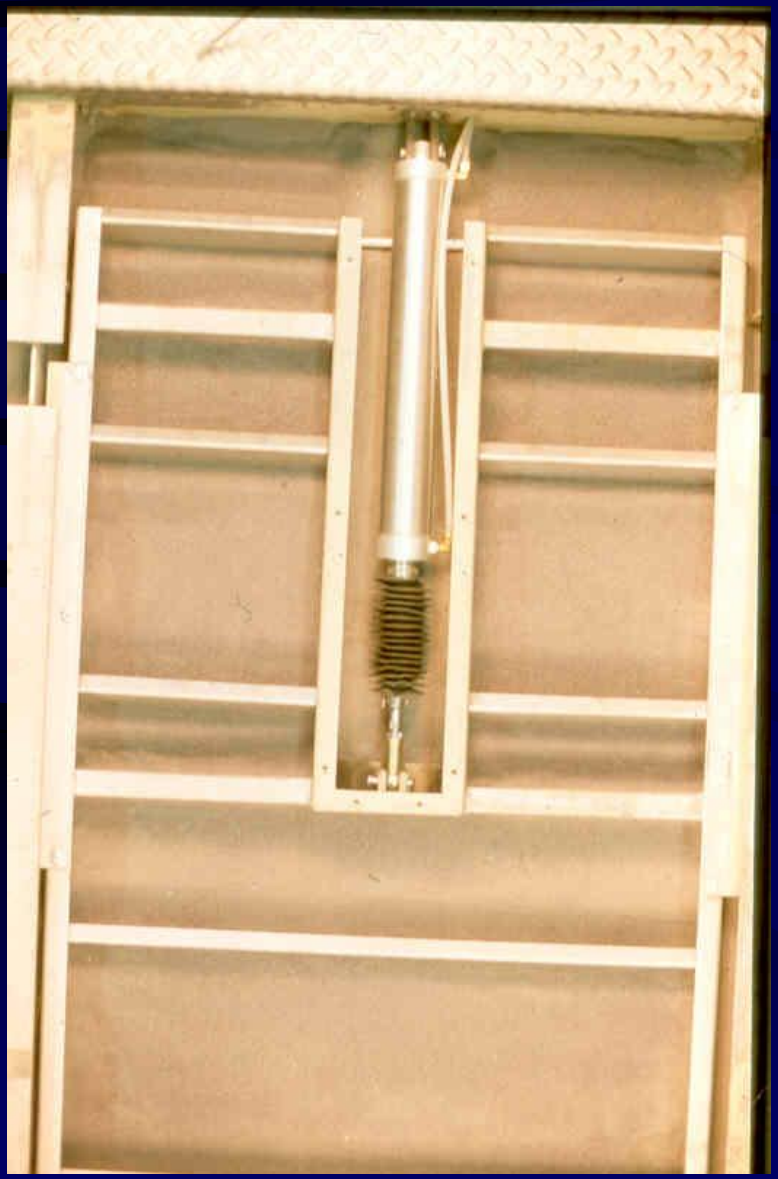
SCREW RECOVERY



FLAT-TRAK

- LOW PROFILE
  - 6-1/2” TALL
  - MINIMAL EXCAVATION REQUIRED FOR PIT
  - SHORT RAMPS ON SURFACE MOUNTS
- FAST INSTALLATION
  - FAST DELIVERY - COMPONENTS SHIPPED FROM STOCK
  - MODULAR FLOOR
  - TRACKS WELDED TO STEEL FLOOR
  - FRAMES DROP IN PLACE BETWEEN TRACKS
- EASY MAINTENANCE

Flat Trak Drive

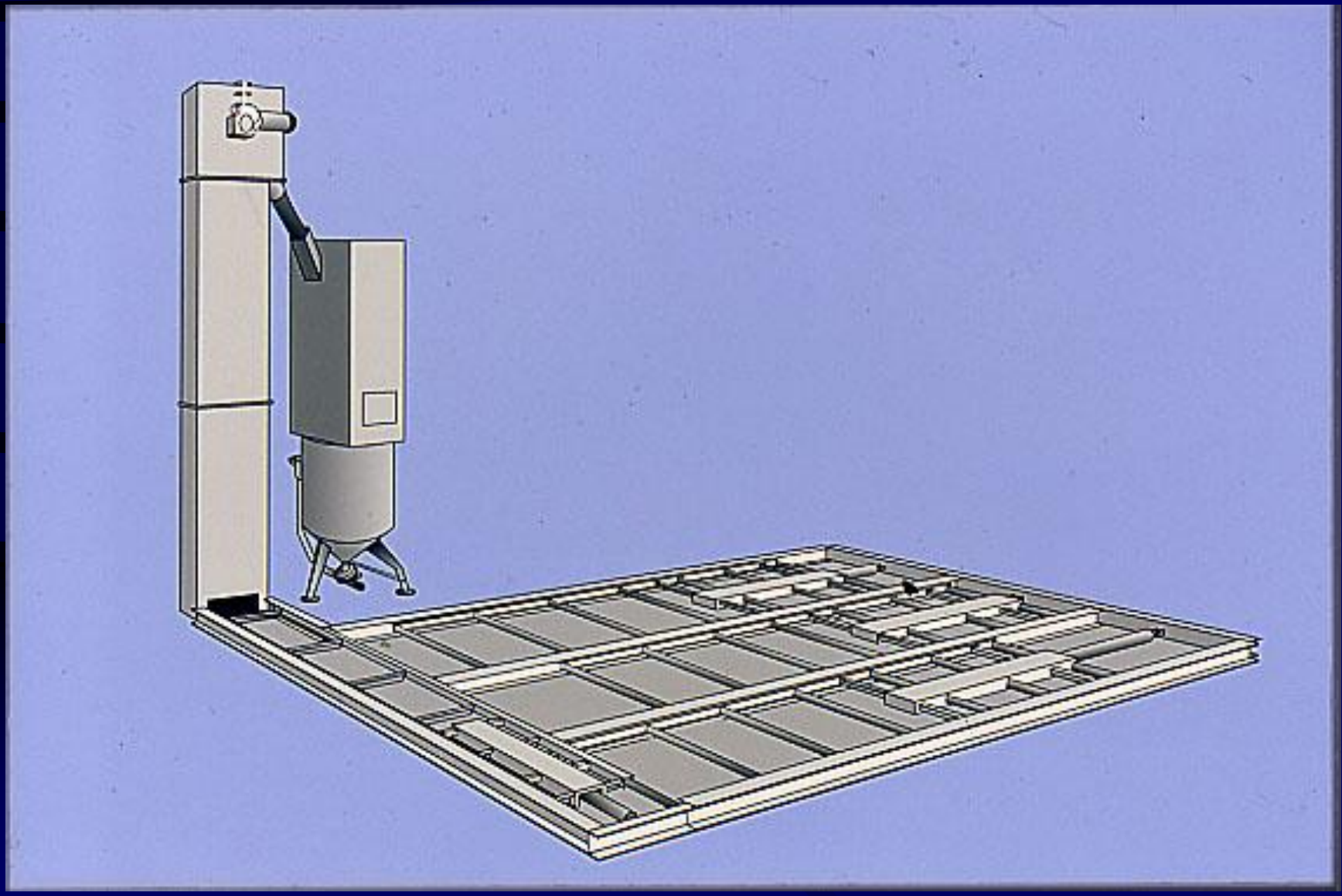


- Booted for protection

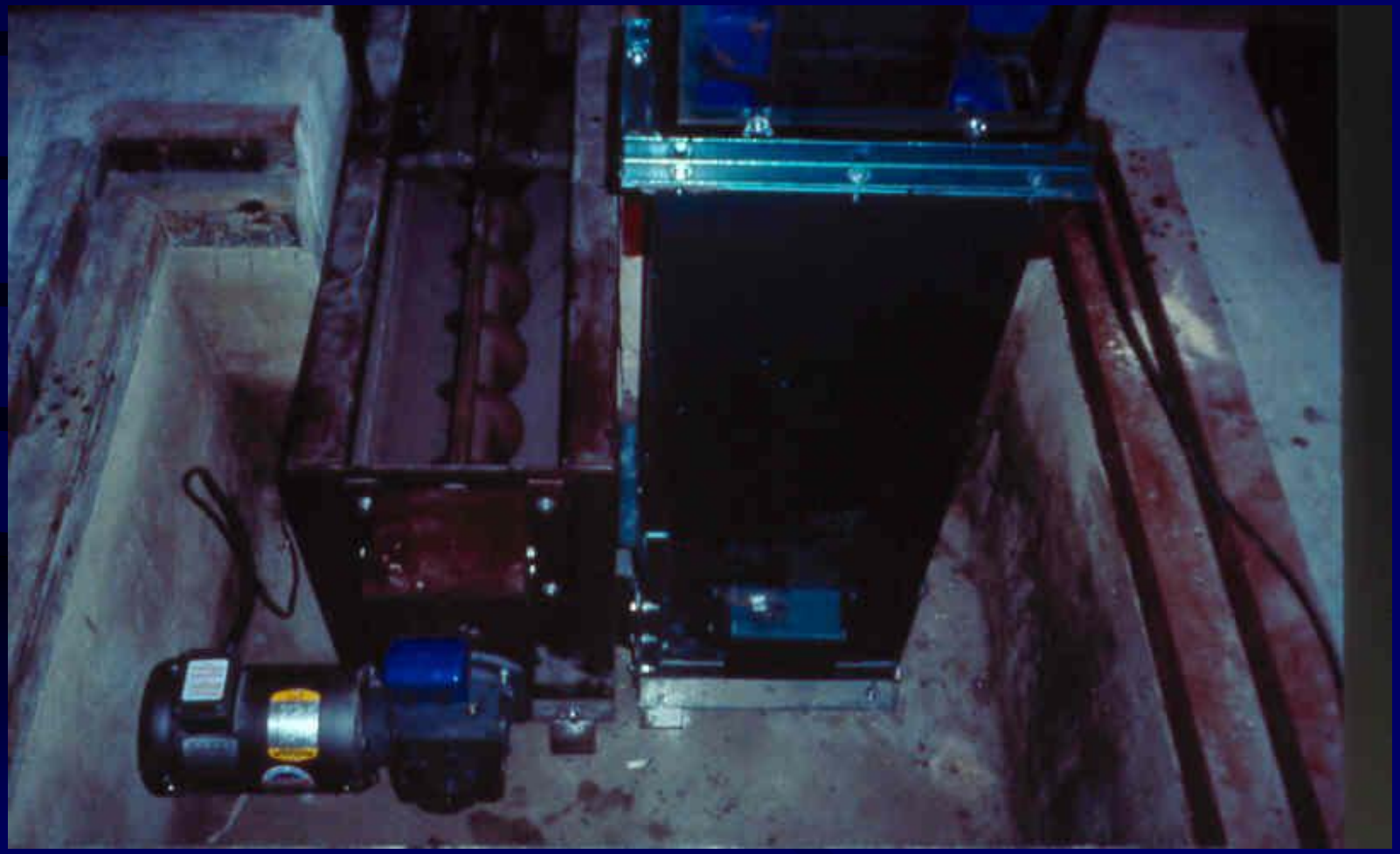
Flat Trak

FLAT-TRAK

FLAT-TRAK



Bucket Elevator



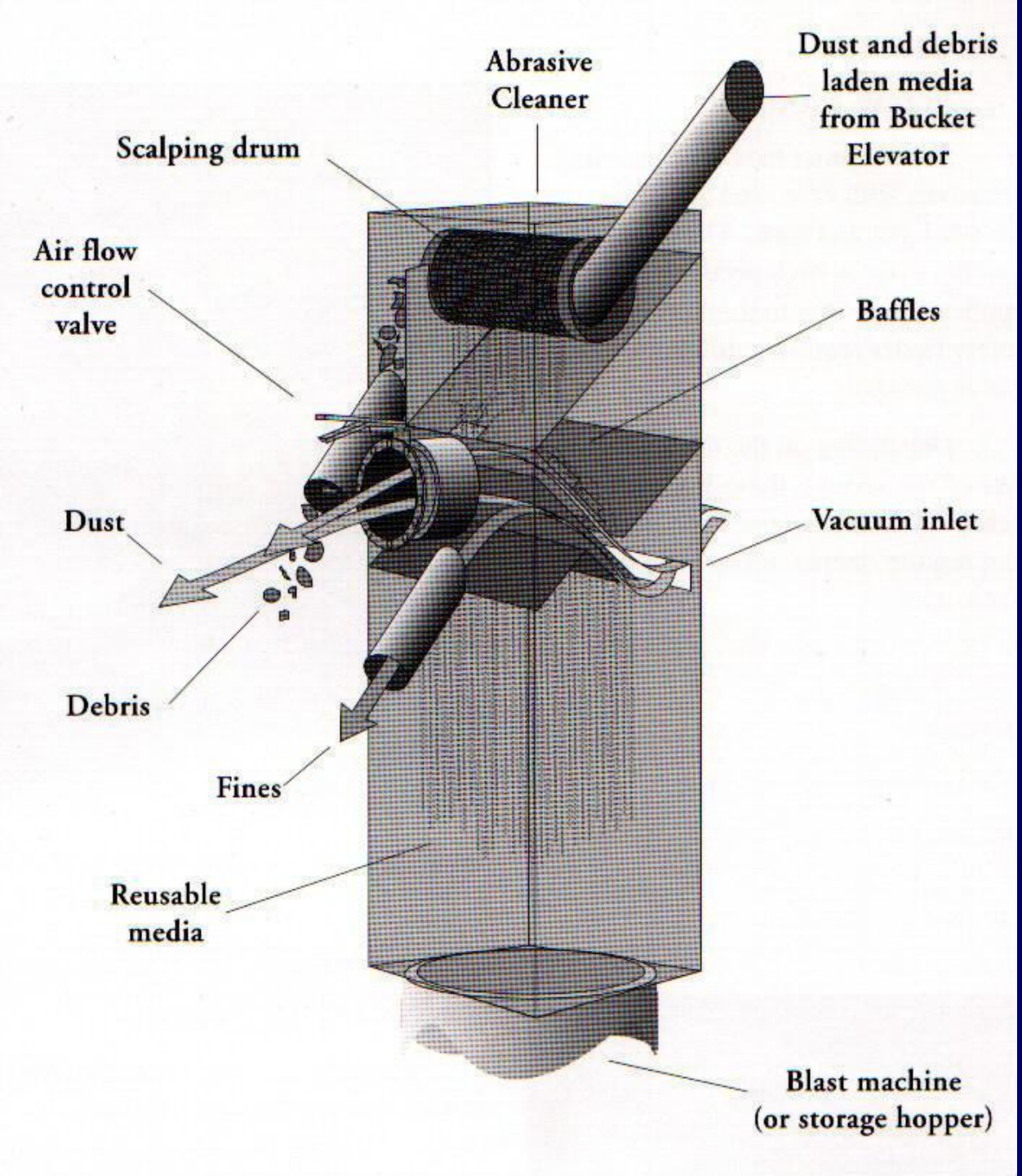
Underspeed Monitor

- Used on all bucket elevators
- Prevents belt breakage

MEDIA CLEANING MECHANICAL SYSTEMS

- ABRASIVE CLEANER
  - BEST FOR HEAVIER MEDIA, I.E. STEEL GRIT
  - ROTARY SCALPING DRUM
    - REMOVES OVERSIZED PARTICLES / DEBRIS
  - HIGH VOLUME STREAM OF AIR
    - REMOVES DUST --- TO DUST COLLECTOR
  - INCLUDES 10 CUBIC FOOT STORAGE HOPPER
  - CAN PROCESS UP TO 15 TONS PER HOUR
  - CAN FEED 1, 2, 3, OR 4 BLAST MACHINES
    - MULTIPLE POT STAND REQUIRED FOR MORE THAN ONE BLAST MACHINE

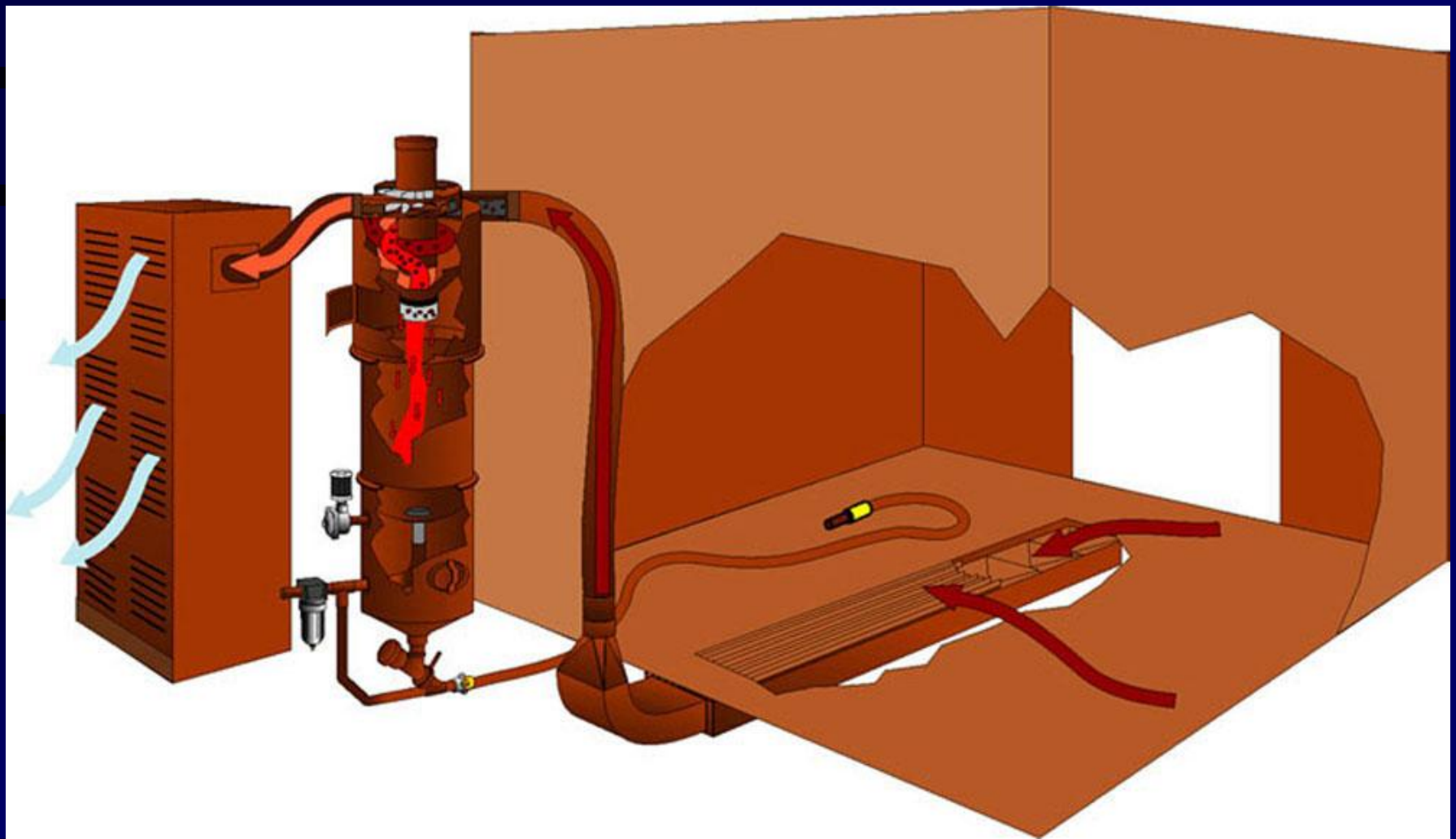
ABRASIVE CLEANER



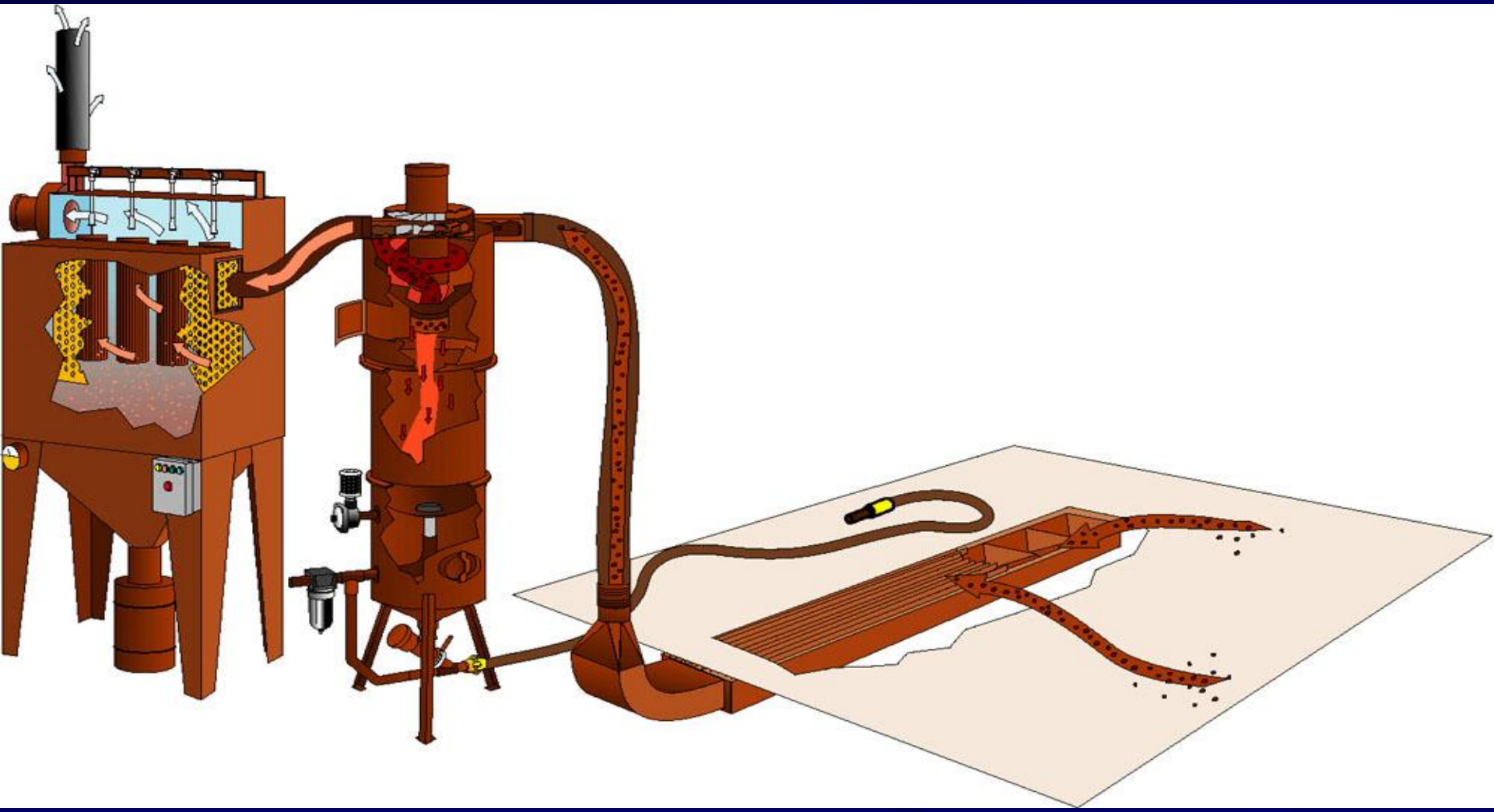
M-Section

- Pneumatically operated channels
- No vibration or screw conveyors
- Handles all light-weight media

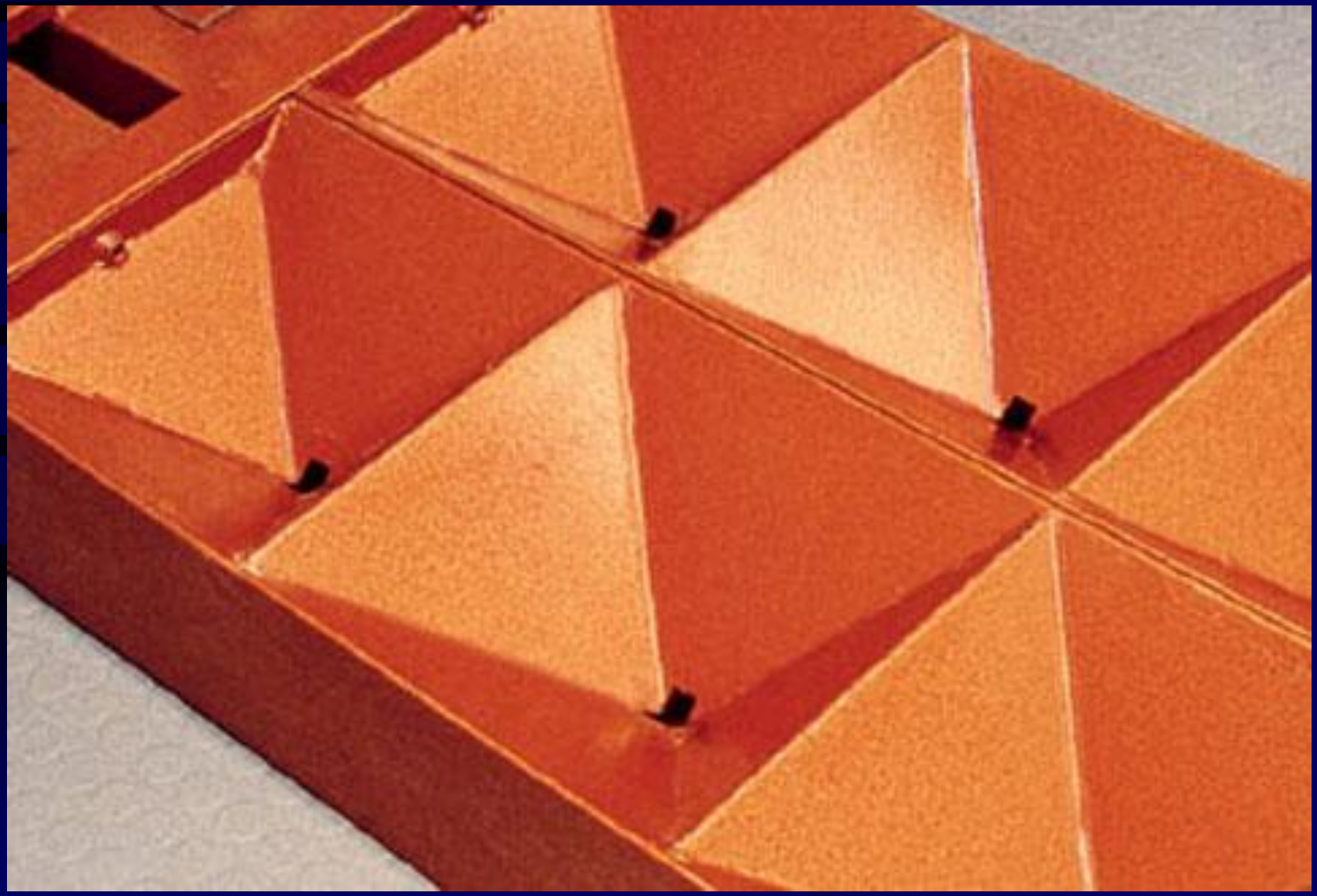
SWEEP-IN M-SECTION WITH DRY FILTER

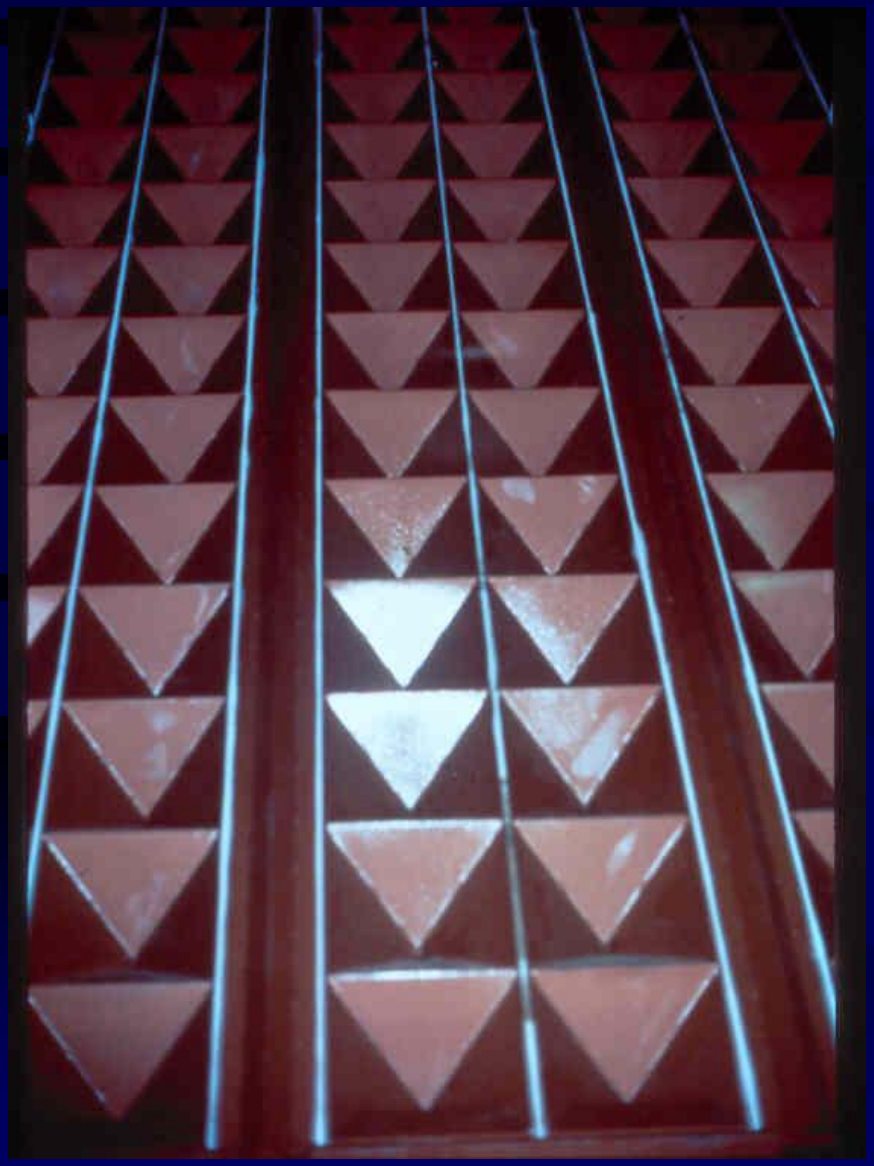


SWEEP-IN M-SECTION WITH RP COLLECTOR



M-SECTION

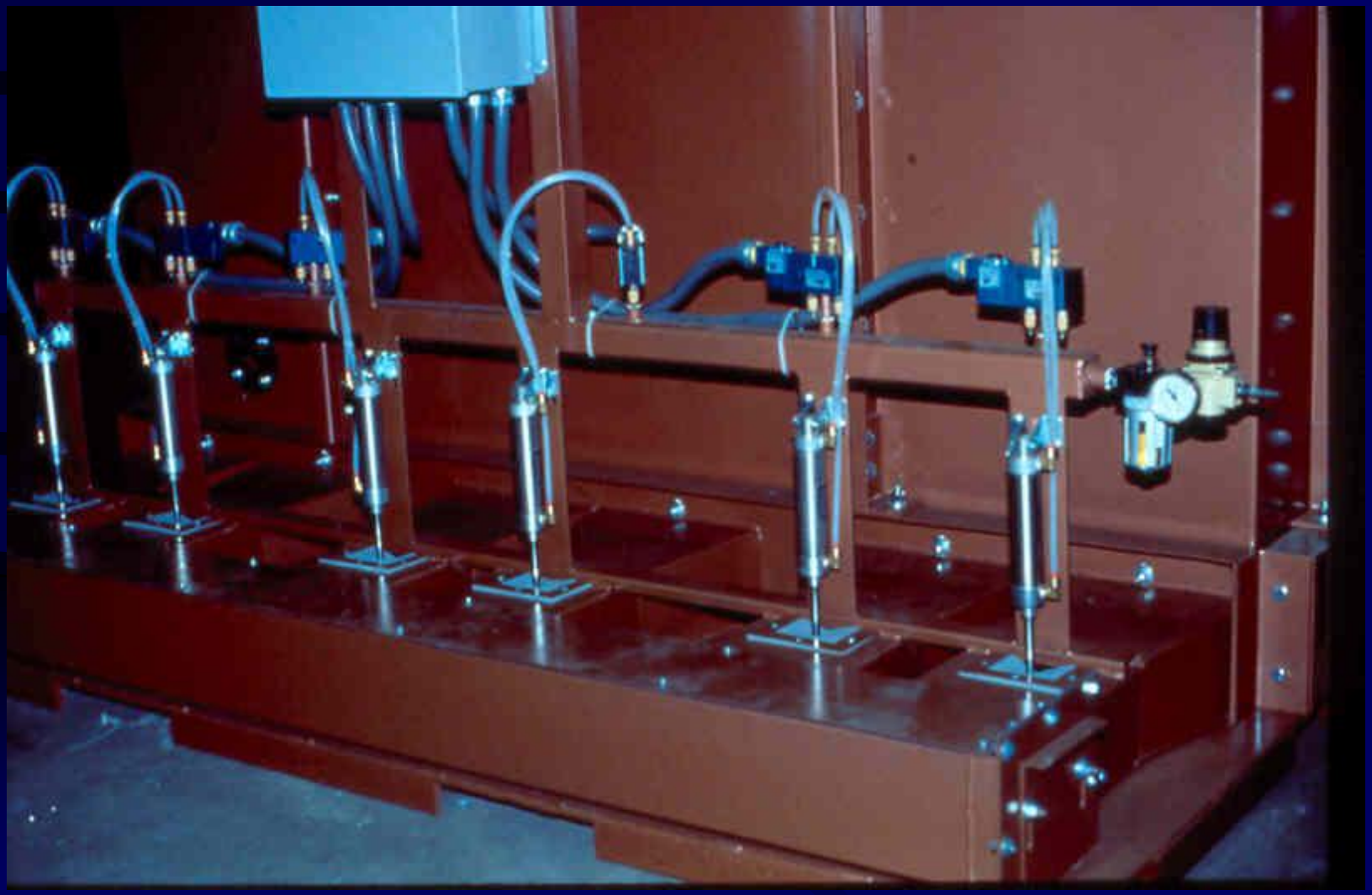




M-section Floor

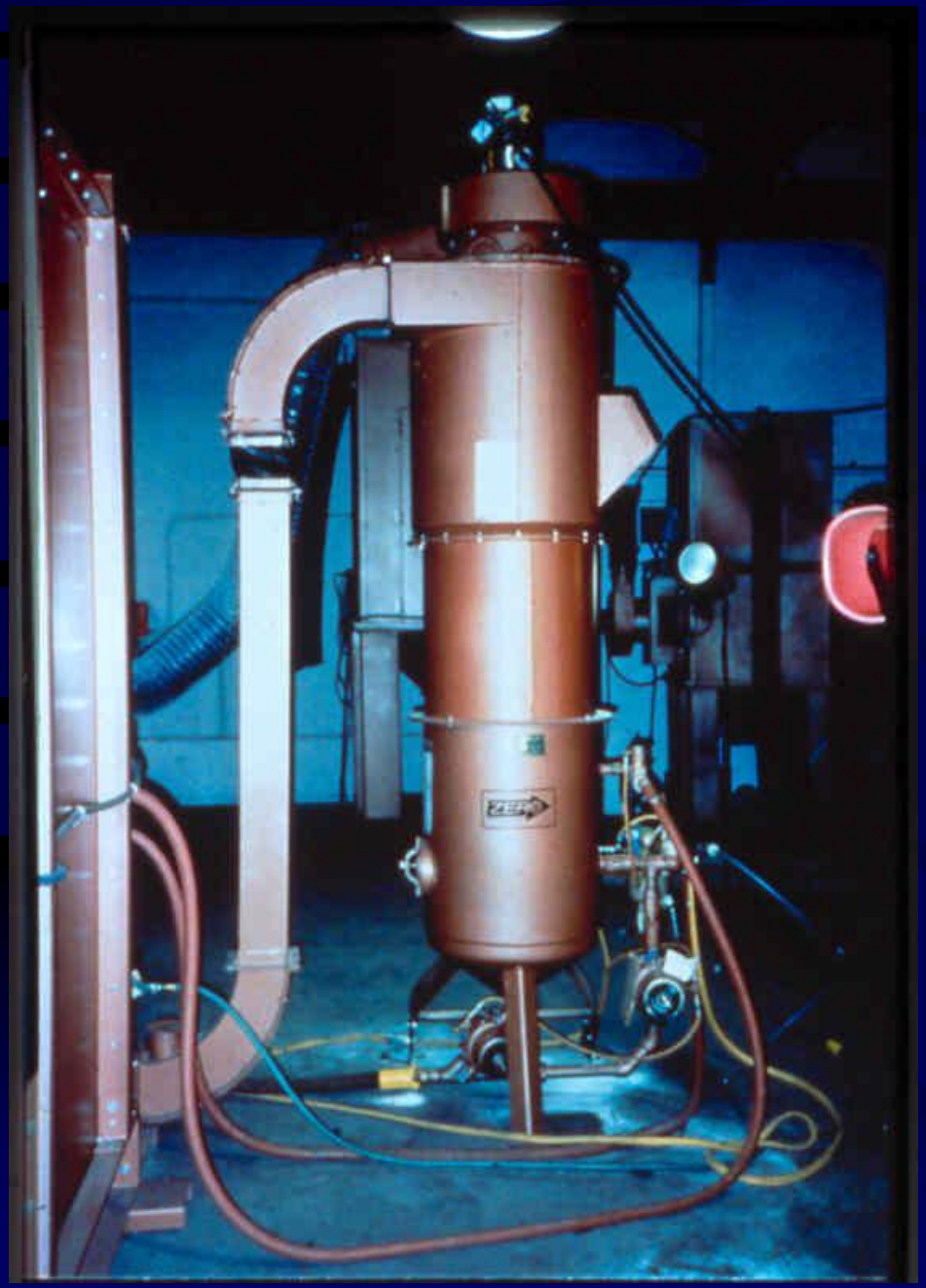
- Full recovery system

Crossdraft Transition



RECLAIMER PNEUMATIC SYSTEMS

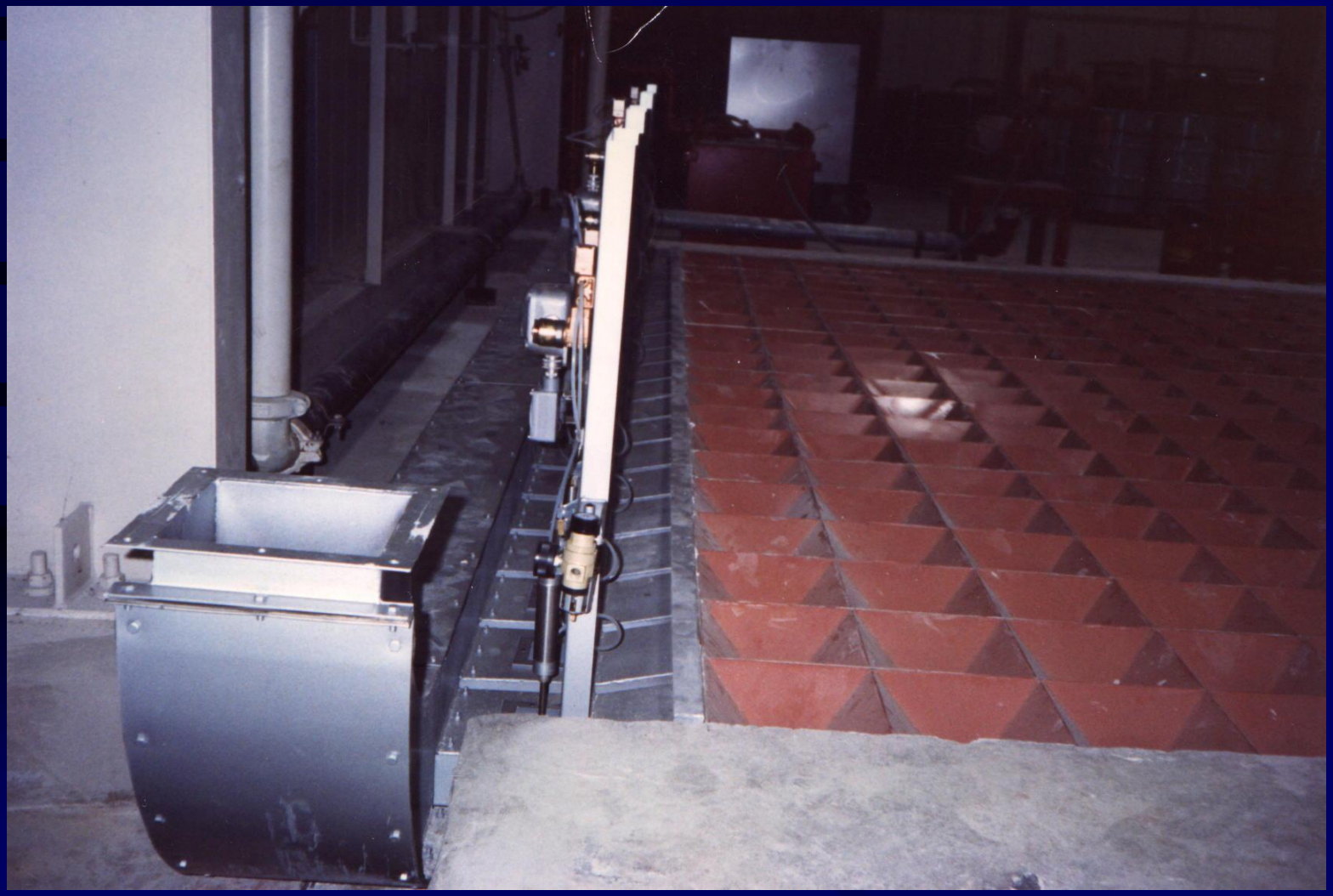
- CYCLONE SEPARATOR FOR USE WITH LIGHTWEIGHT MEDIA
- MEDIA, DUST, AND DEBRIS ENTER RECLAIMER WHERE THEY SPIN
- DUST, FINES, AND BROKEN MEDIA ARE DRAWN OUT WITH EXHAUST AIR TO DUST COLLECTOR
- ONLY CLEAN, REUSABLE MEDIA ENTERS BLAST MACHINE
- RUBBER-LINED TOP SECTIONS ARE NEEDED WITH AGGRESSIVE MEDIA



Blast & Reclaim System

- Reclaim
- Storage Hopper
- Blast Machine

M-SECTION
RECOVERY & TRANSITION



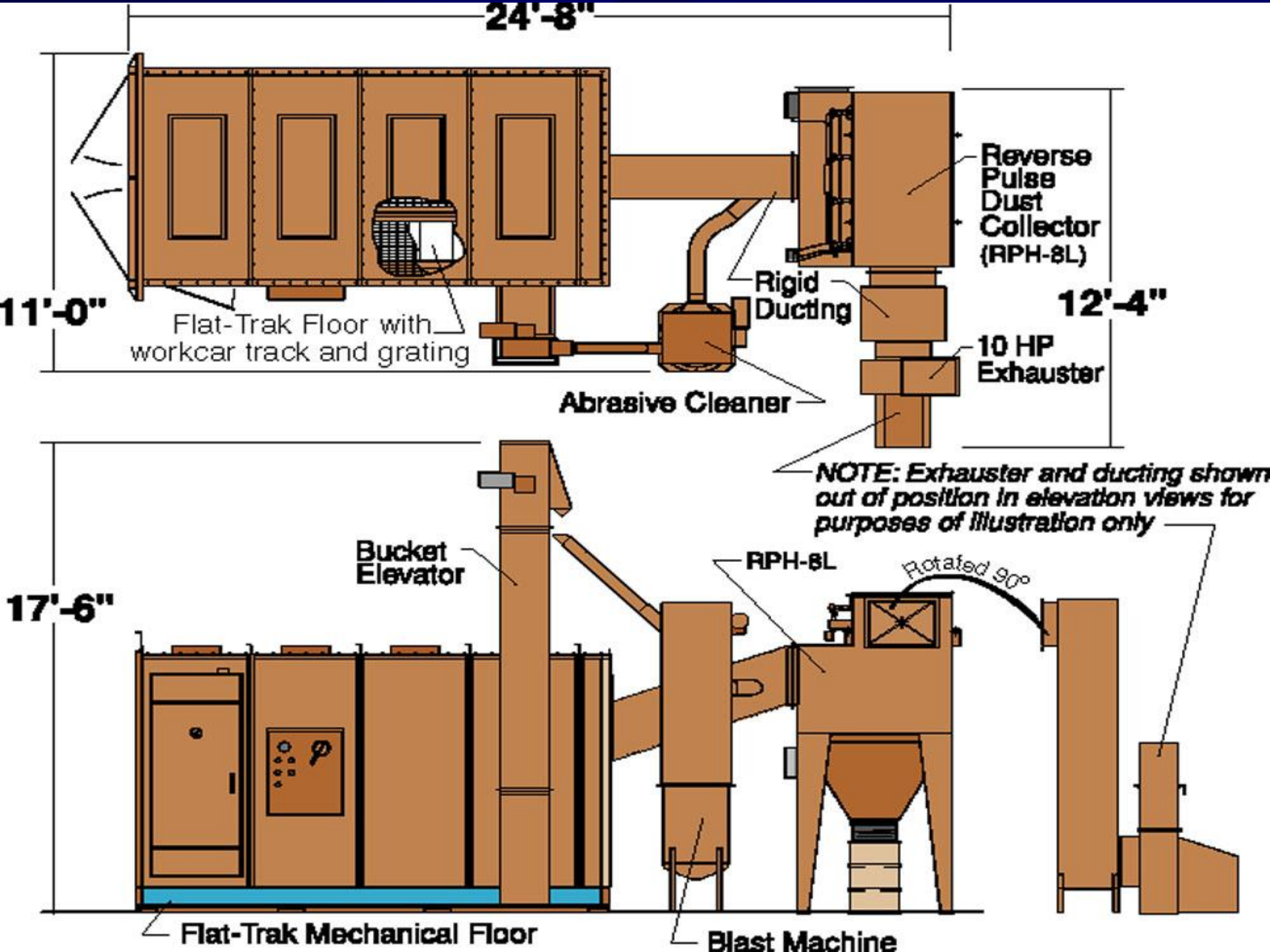
M-SECTION FULL-FLOOR
(note wall sheeting for improved illumination)

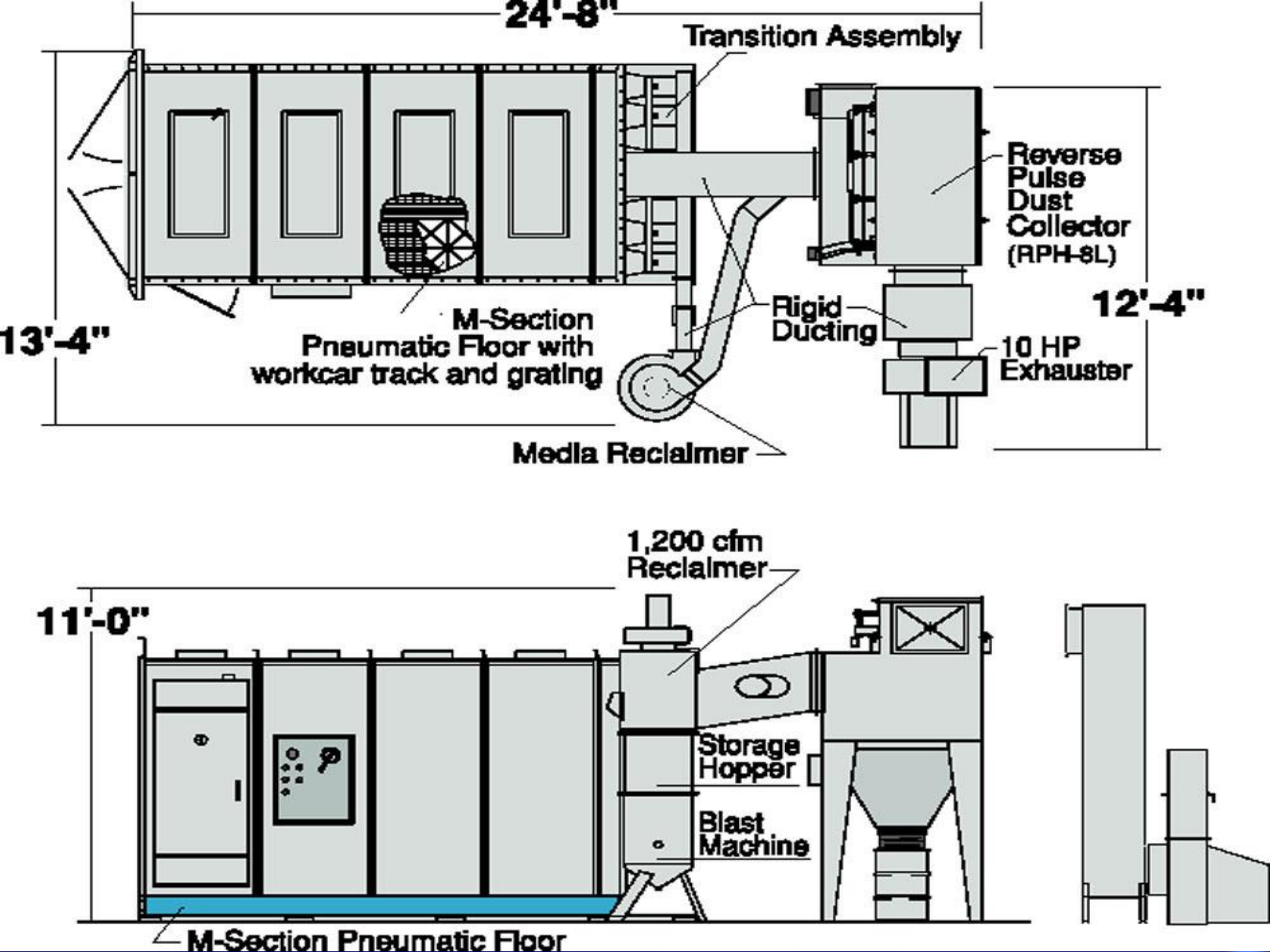
PRE-ASSEMBLED BLAST ROOMS

- AVAILABLE FOR ALL TYPES OF RECYCLABLE MEDIA
  - FLAT-TRAK RECOVERY SYSTEM WITH ABRASIVE CLEANER FOR USE WITH HEAVY MEDIA, I.E. STEEL GRIT
  - M-SECTION RECOVERY SYSTEM WITH RECLAIMER FOR USE WITH LIGHTWEIGHT MEDIA, I.E. GLASS BEADS OR ALOX

Preassembled Room

Preassembled Room


24'-8"
11'-0"
Flat-Trak Floor with workcar track and grating
Reverse Pulse Dust Collector (RPH-8L)
Rigid Ducting
12'-4"
10 HP Exhauster
Abrasive Cleaner
NOTE: Exhauster and ducting shown out of position in elevation views for purposes of illustration only
17'-6"
Bucket Elevator
RPH-8L
Rotated 90°
Flat-Trak Mechanical Floor
Blast Machine


24'-8"
Transition Assembly
Reverse Pulse Dust Collector (RPH-8L)
12'-4"
13'-4"
M-Section Pneumatic Floor with workcar track and grating
Rigid Ducting
10 HP Exhauster
Media Reclaimer
1,200 cfm Reclaimer
11'-0"
Storage Hopper
Blast Machine
M-Section Pneumatic Floor

BLAST MACHINES

- AUTOMATICALLY REFILLED AFTER MEDIA HAS BEEN CLEANED
- MEDIA VALVE(S) MUST BE SUITABLE FOR THE ABRASIVE BEING USED
- BOTTOM CONE MUST ACCOMMODATE ANGLE OF REPOSE OF MEDIA BEING USED
- MUST BE EQUIPPED WITH REMOTE CONTROLS

VENTILATION

- PROVIDED BY DUST COLLECTOR FAN
- INLET VELOCITY: 500 FT/MIN MINIMUM
- CROSSDRAFT VENTILATION RATES
  - 50 FEET/MIN FOR STEEL OR GLASS BEADS
  - 80 FEET/MIN FOR ALUMINUM OXIDE
  - 100 FEET/MIN FOR SAND OR DUSTY MEDIA

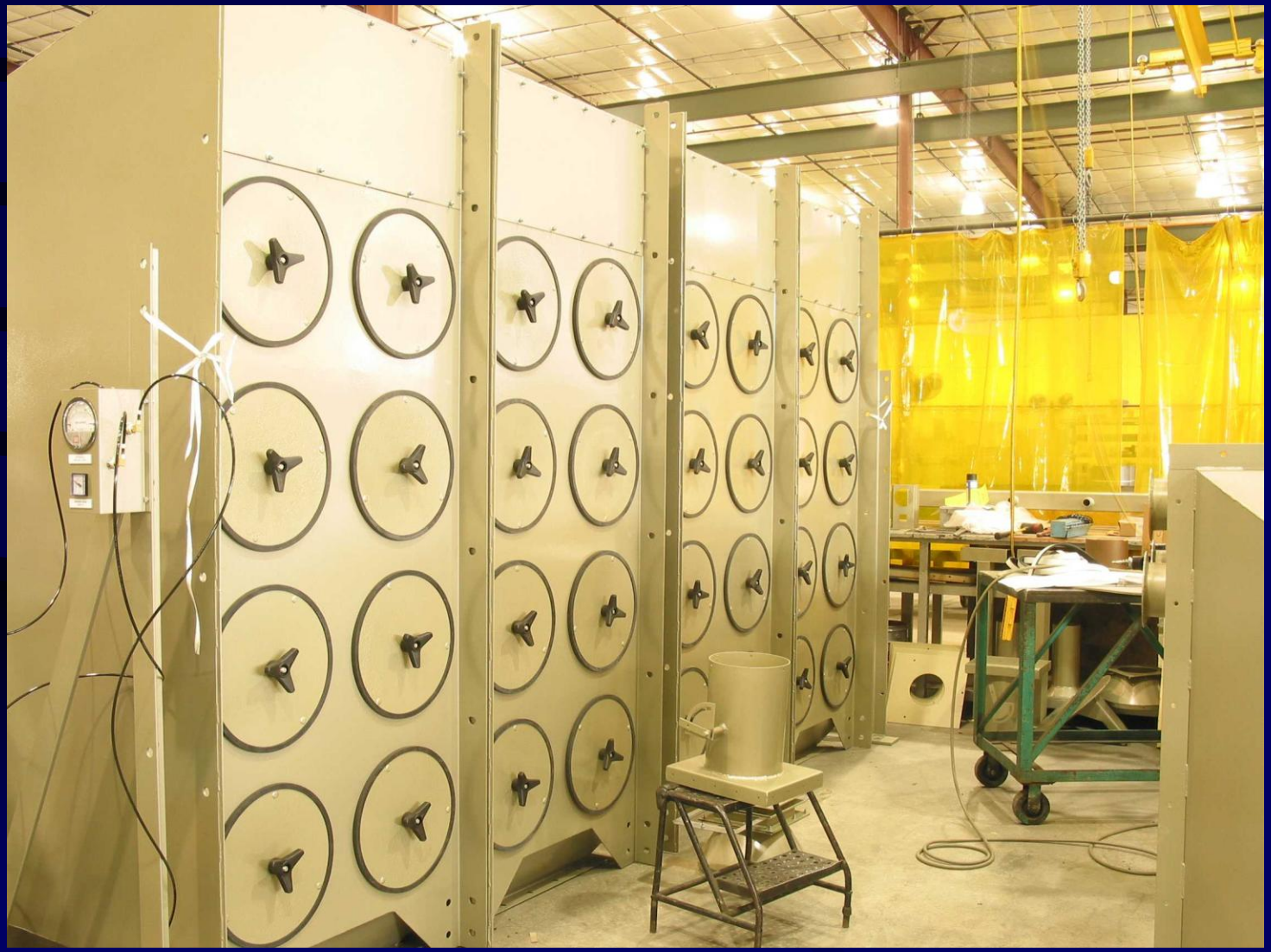
VENTILATION

- REVERSE-PULSE CARTRIDGE
  - FILTERS 99.85%
  - EXHAUSTED AIR IS 0.00218 GRAINS/CUBIC FT
  - AIR TO CLOTH RATIO OF 2:1 OR LESS
  - COMPACT, MODULAR UNITS

Dust Collector

- 4000 - 300000 CFM
- Sloped roof
- Modular construction

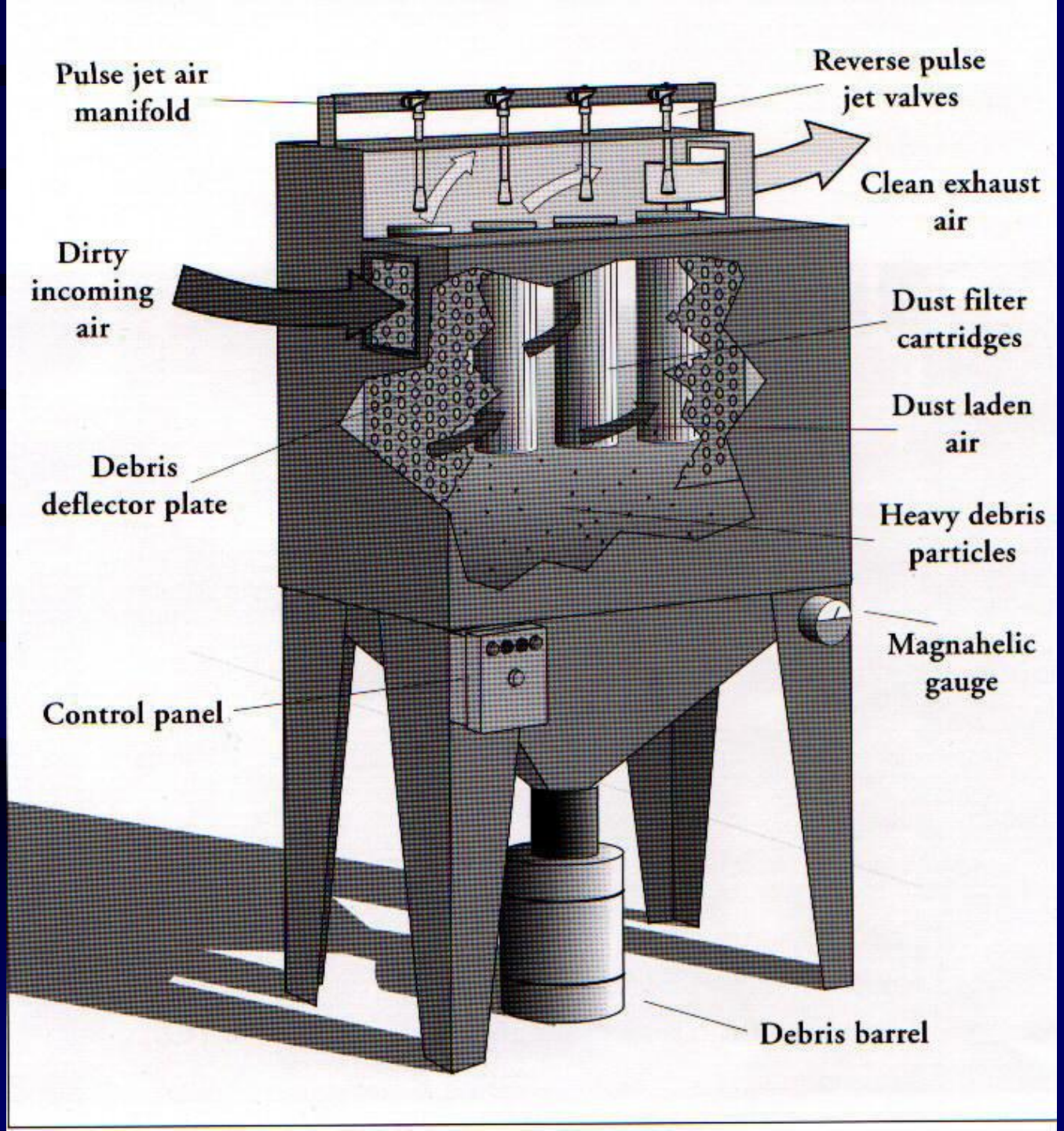
Dust Collector



DUST COLLECTION

Dust Collector

- Magnehelic Gauge
- Pressure Gauge


Pulse jet air manifold
Reverse pulse jet valves
Clean exhaust air
Dirty incoming air
Dust filter cartridges
Dust laden air
Debris deflector plate
Heavy debris particles
Magnahelic gauge
Control panel
Debris barrel

DUST COLLECTION / DUCTING

VENTILATION

- TO DETERMINE THE SIZE OF THE DUST COLLECTOR, USE THIS FORMULA:

CFM of collector = A

Room Width = W

Room Height = H

Ventilation Rate = V

$$A = W \times H \times V$$

For a room 10’ x 10’ x 20’ with steel grit, we use:

A = 10’ x 10’ x 50’/min

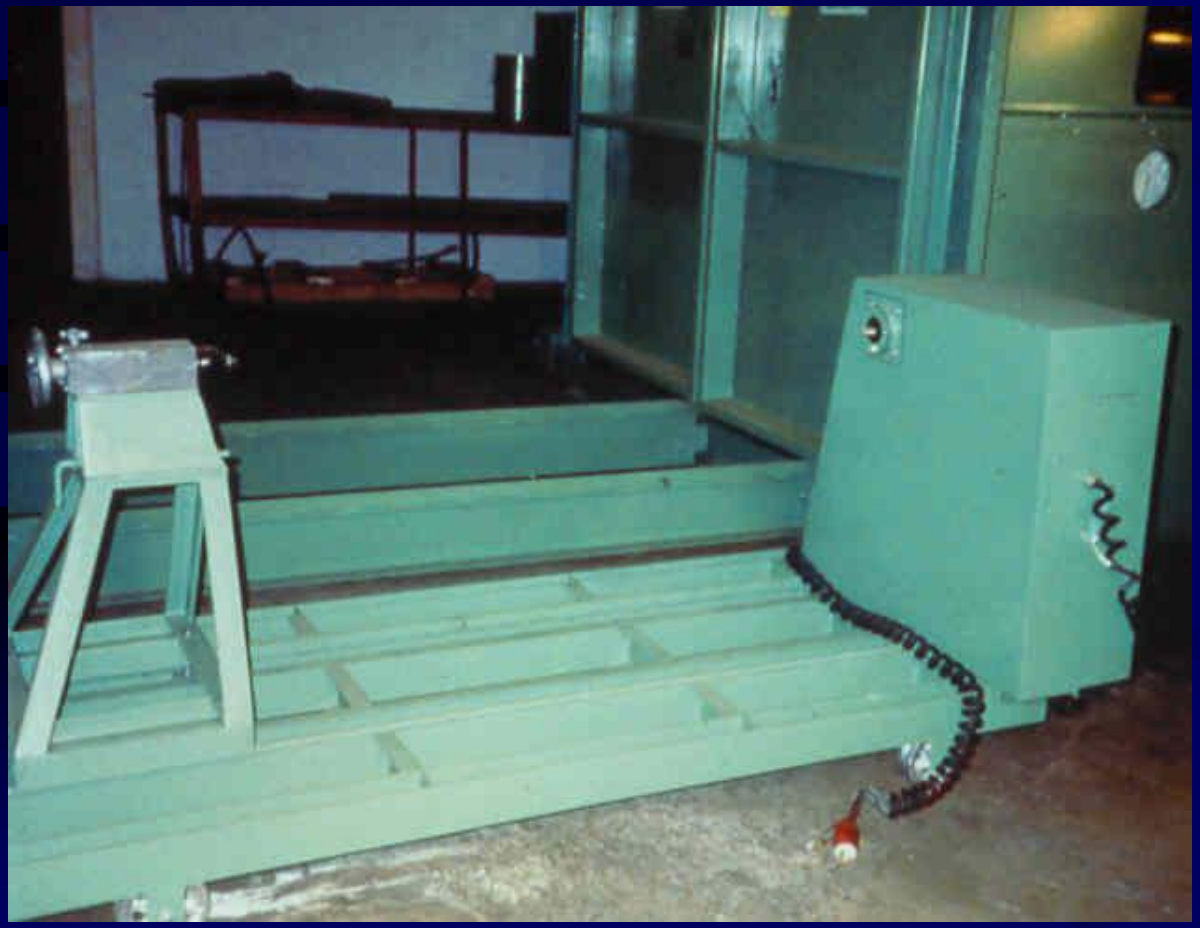
A = 5000 CFM

WORK-PIECE HANDLING

- FORKLIFTS
- RAIL-MOUNTED WORK CARS
- OVERHEAD MONORAILS
- EXTERIOR WORK STATIONS
- TURNTABLES
- HORIZONTAL ROTATION DEVICES

OVERHEAD MONORAIL

Workpiece Handling



- Powered horizontal rotation

TURNTABLE/WORKCAR/TRACK

DROP-DOWN TURNTABLE

ELECTRICAL CONTROL PANEL

- INCLUDES MOTOR STARTERS
- AUTOMATED START-UP PROGRAM
  - AVOIDS MEDIA JAMMING AND EQUIPMENT DAMAGE
- HOUR METER MONITORS USAGE
  - AIDS IN SCHEDULED MAINTENANCE TASKS

COMPRESSED AIR SUPPLY

- POWER FOR MANY COMPONENTS
  - AUTOMATED FLOORS
  - REVERSE PULSE COLLECTORS
  - BLASTING OPERATION
    - NOZZLE ORIFICE
    - NUMBER OF OPERATORS
  - SUPPLIED AIR RESPIRATORS
- CONSIDER OTHER DEMANDS ON SHOP AIR

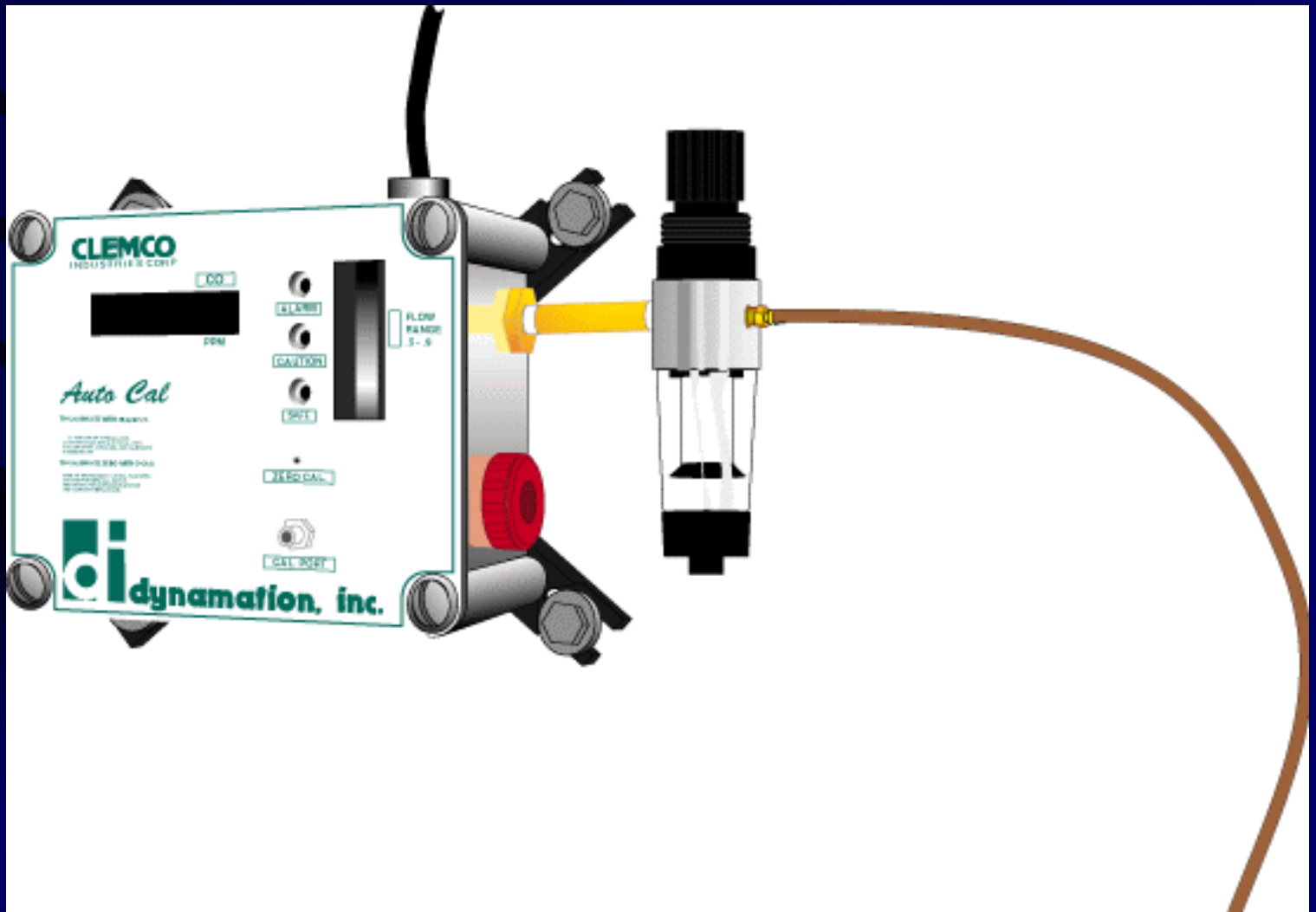
OPERATOR SAFETY EQUIPMENT

- AIR-FED RESPIRATOR
  - APOLLO 60 OR APOLLO 20
- AIR FILTER
  - CPF-20 OR CPF-80
- CO MONITOR AND ALARM
  - CMS-1
- PROTECTIVE CLOTHING
  - BLAST SUITS
- HELMET COMMUNICATION SYSTEMS
  - HCS-1

APOLLO 60 RESPIRATOR

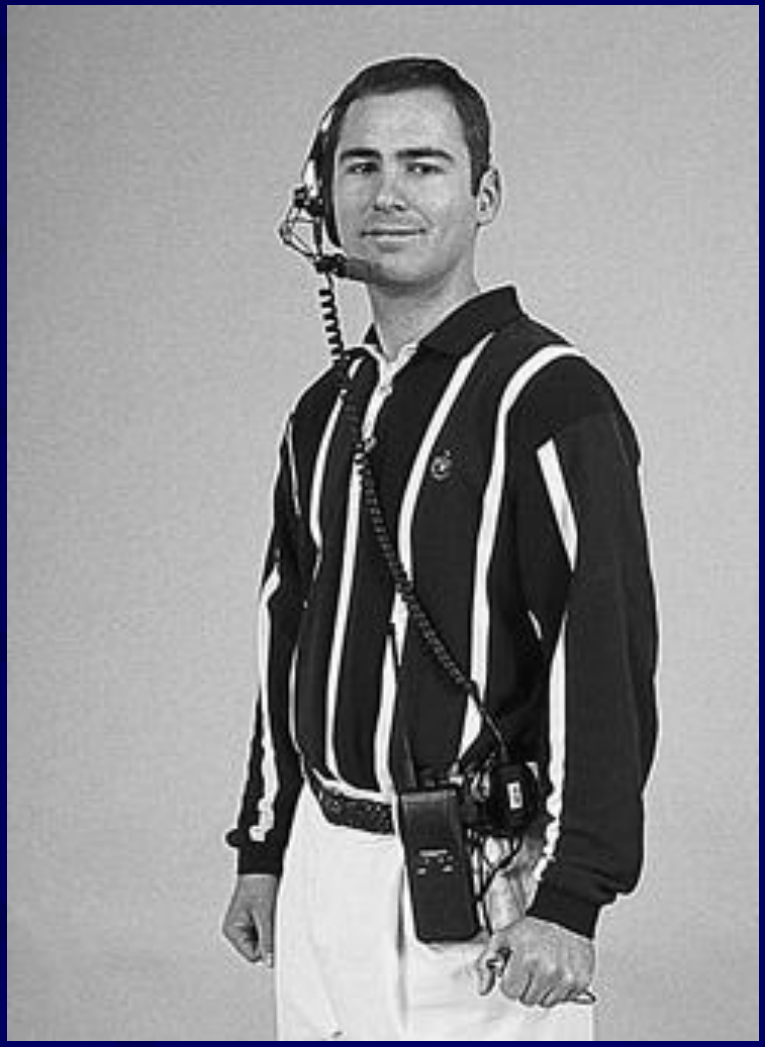
CPF-20 BREATHING AIR FILTER

CARBON MONOXIDE MONITOR ALARM

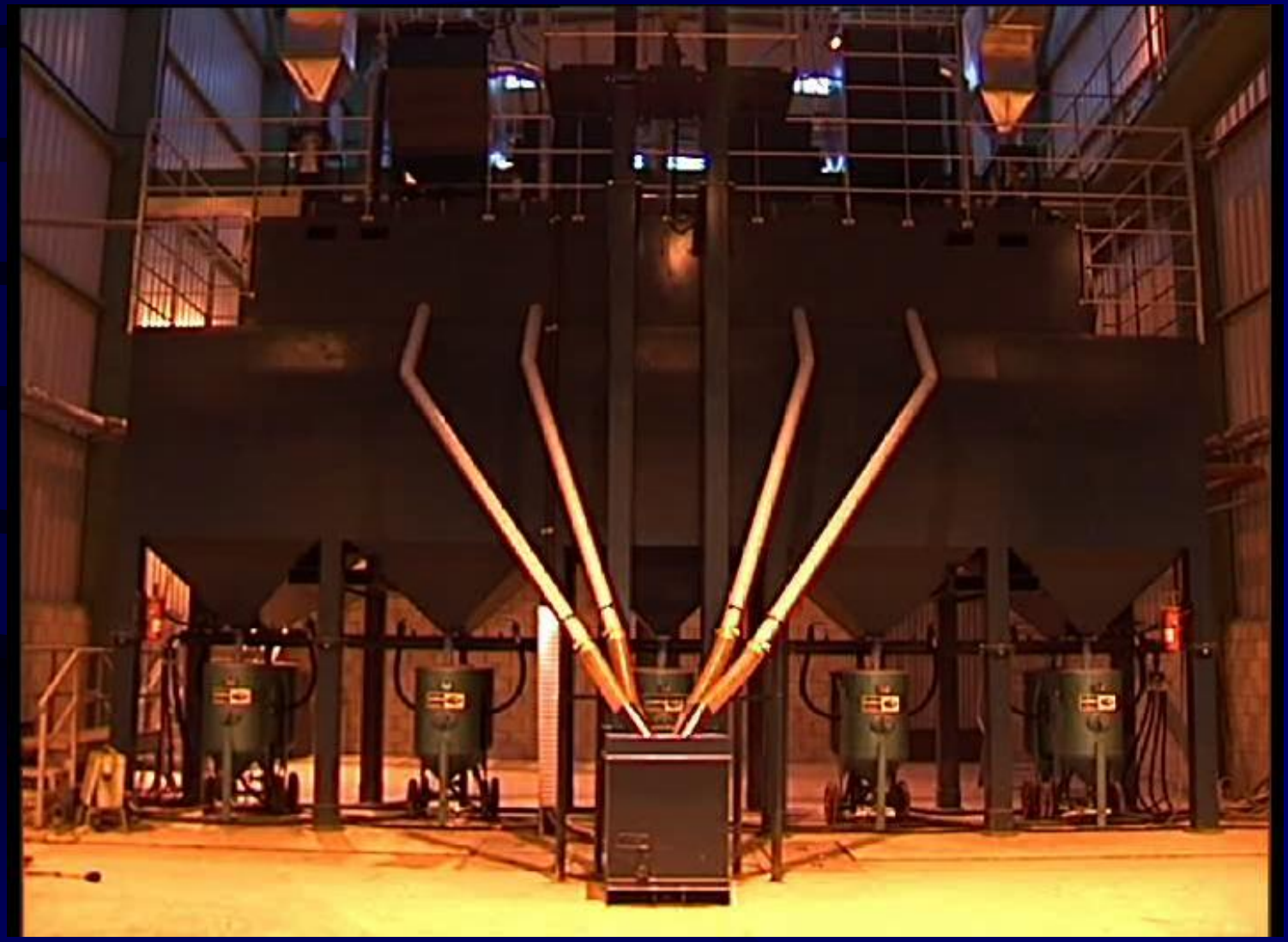


CLEMCO BLAST SUIT

HELMET COMMUNICATIONS

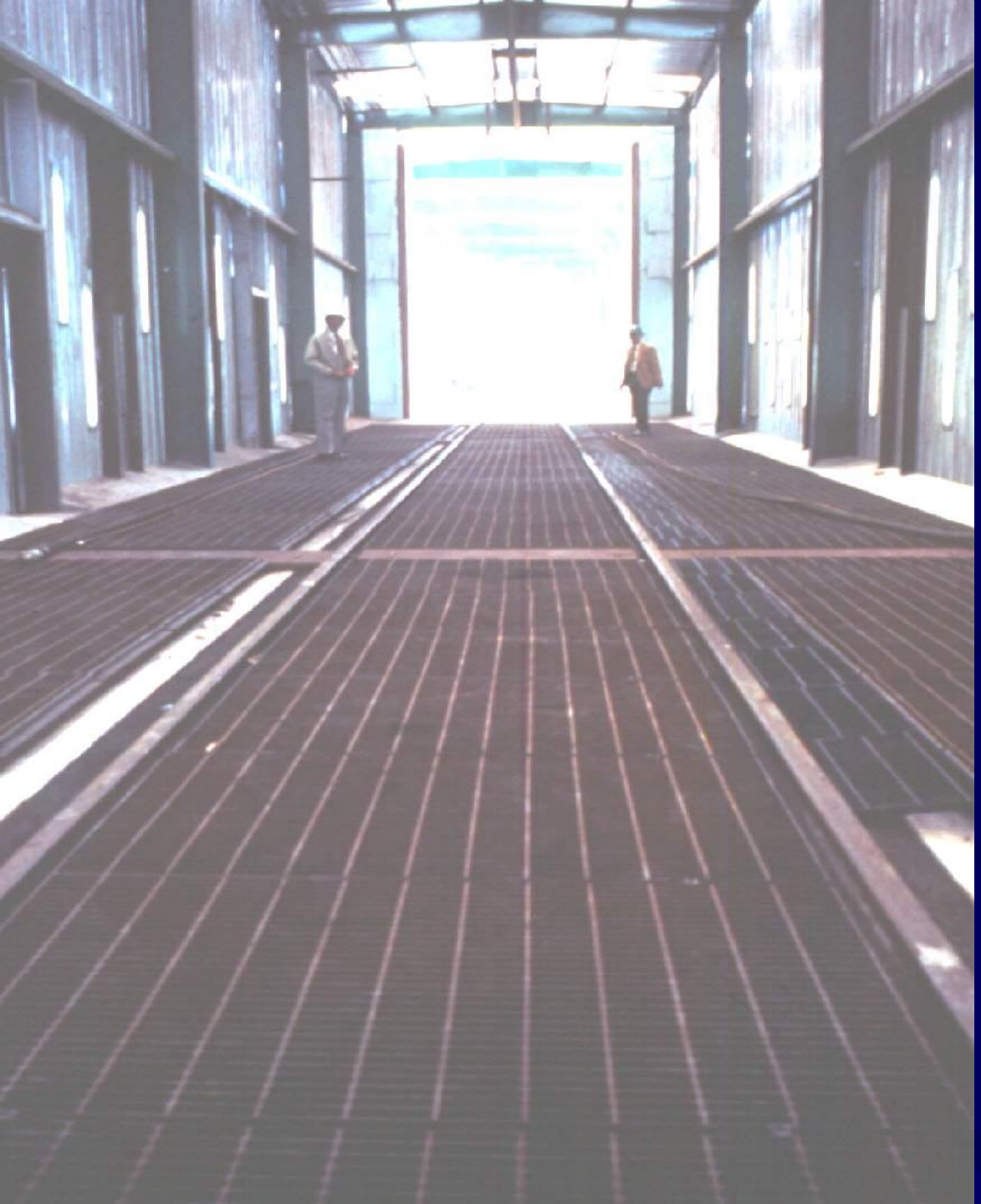


BLAST & PAINT ROOM



AIRCRAFT STRIP BOOTHS

MEDIUM SIZED & SMALL BOOTHS



Thank you

CLEMCO WORLDWIDE

The demand for abrasive blasting is extensive. Ship building and maintenance in Singapore, construction in Saudi Arabia, refining in Houston… these are but a few of the major industries where abrasive blasting has kept pace with demand calling for Clemco specialization and innovation. Manufacturing and distribution throughout 6 continents… wherever there is industry, Clemco is there.